UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

MEMORANDUM

SUBJECT: Updated Waste Determination for OU4 Engineering Evaluation/Cost Analysis

DATE: August 21, 2017

FROM: Tonya Howell, Remedial Project Manager

THRU: Kristen Nazar, Site Attorney

TO: Des Moines TCE Superfund Site File (0725)

The Des Moines TCE Site, owned by Dico, Inc., is located in downtown Des Moines, Iowa, and has been a NPL Superfund site since 1983. The Site consists of 4 operable units (OUs). These include:

- OU1 – Contaminated groundwater;
- OU2/OU4 – Contamination found in on-site buildings, the South Pond Area (SPA), and source areas of site chemicals of concern (COCs);
- OU3 – Contaminated groundwater north of the Dico property.

During the 2013 Five-Year Review, protectiveness was deferred due to lack of information associated with the ecological risk of the SPA. In 2015, the EPA performed an ecological risk assessment in the SPA and found potentially unacceptable ecological risk due to pesticide contamination. Because of the high concentrations of pesticides in the SPA and the change in zoning for the site from industrial to commercial/residential, the EPA collected additional samples to reevaluate the Human Health Risk Assessment for the SPA and the abandoned buildings and building foundations on site. The Human Health Risk Assessment found potentially unacceptable risk associated with both the SPA and buildings/building foundations due to current potential use and the change in potential future use. As such, EPA worked with Tetra Tech (START contractor) to perform revised Focused Feasibility Studies (FFS) to evaluate potential remedy changes associated with the SPA and the buildings/building foundations, both of which are part of OU4. Tetra Tech is now in the process of converting the FFS for the building/building foundations into an Engineering Evaluation/Cost Analysis (EE/CA) in order to conduct a non-time critical removal action.

A hazardous waste determination in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA) is important to calculate differences in handling costs associated with waste disposal and to evaluate Applicable or Relevant and Appropriate Requirements in accordance with the National Contingency Plan. The determinations made in this memo are not final waste disposal determinations, but serve to support the analysis and cost estimates for waste disposal. Final waste disposal decisions should be based upon sampling as required by state or federal regulation and by the receiving facility.

The EPA has reviewed the site file and sampling results for the SPA, building material, and building foundation material to determine if the media would be classified as hazardous waste and how this would affect the potential remedies to be evaluated in the FFS and EE/CA. An initial determination was made on November 22, 2016, stating that all the material that was being addressed under the FFS and EE/CA would be classified as hazardous waste; however, further file review and consultation with subject matter experts has led to a reevaluation of how different materials at the site should be classified. The revised waste determinations as of August 7, 2017 are described below. These waste determinations may be modified or updated based on conditions found on-site.

WASTE CHARACTERIZATION

Historic sampling and sampling performed in June 2016 showed that some of the building materials contain dioxin, polychlorinated biphenyls (PCBs), and/or pesticides. Some of the building materials, such as metal I-beams and steel supports, may be decontaminated and disposed of as non-hazardous waste. However, for the porous material that cannot be decontaminated, a waste determination needs to be made to evaluate potential remedies in the FFS and the EE/CA. The dioxin and PCB determinations are consistent across the buildings. The hazardous waste determination associated with pesticide contamination is more complex and is broken down by building.

Dioxin – The results of the June 2016 sampling show that dioxin was detected in several of the building samples. Upon generation, it must also be determined if the dioxin-contaminated material destined for disposal meets one of the definitions of a F-Listed, U-Listed or P-Listed hazardous waste as defined in 40 C.F.R. § 261.33.

Dico produced 2,4-trichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlororphenoxyacetic acid (2,4,5-T). Per the CDC website, the CAS number for 2,4-trichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlororphenoxyacetic acid is 93-76-5. This waste is listed in 40 C.F.R. § 261.33, which identifies P- and U-listed wastes, as a potential F027-listed waste. F027 is the only potential F listing that may apply to the dioxin-contaminated building material. F027 is defined as "[d]iscarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)" The EPA recommends that available site information, such as storage records and manifests, be used in an effort to ascertain the sources of wastes, but "when this documentation is not available or inconclusive the lead agency may assume that the wastes (or contaminants) are not listed RCRA hazardous wastes." See "Management of Remediation Wastes Under RCRA," and discussion in preambles to the then proposed regulations, 53 Fed. Reg. 51444 (December 21, 1988), 55 Fed. Reg. 8758 (March 13, 1990), and 61 Fed. Reg. 18805 (April 29, 1996). The EPA is not aware of any information that unused dioxin was ever discarded at the Dico property. Therefore, the EPA has concluded that the dioxin-contaminated waste is not F027 listed waste.

On or Off-Site Disposal of Dioxin Contaminated Building Materials

A receiving disposal facility would likely require one or more composite samples of building materials to determine a dioxin toxic equivalent (TEQ) concentration. Based on the existing sampling data, the

resulting dioxin TEQ numbers may likely be in the 50-100 ppt range or less. A similar analysis for dioxin TEQ concentration would occur if dioxin contaminated building materials were left on-site. Results would be compared against a site-specific screening level.

PCBs - PCBs were detected in several of the June 2016 building material samples. The highest PCB detection, 58 parts per million (ppm), was found in Building 3 in a sample of the epoxy paint overlying building material (brick/cinder block), although historic samples showed higher concentrations of PCBs within the building insulation.

Off-Site Disposal of PCB-Contaminated Building Materials

PCB-contaminated building material can be disposed of either as remediation or bulk product waste per EPA regulations found at 40 C.F.R. Part 761. The building materials from Buildings 4 and 5 were previously removed from the Des Moines TCE Site to the Southern Iowa Mechanical Site, in contravention of the Des Moines TCE Site Record of Decision and in violation of a 1994 Unilateral Administrative Order issued by the EPA. A review of the EPA files for the Southern Iowa Mechanical Site shows an extensive discussion on whether building material contaminated with PCBs would be classified as remediation or bulk product waste. An e-mail dated August 21, 2008, from Lachala Kemp (EPA Region 7 Chemical Risk Information Branch) stated that the adhesive (containing PCBs) on the insulation would be bulk product waste and the remaining material would be remediation waste; however, as it was too difficult to separate the bulk product waste from the remediation waste, all of it could be treated as bulk product waste and go to a solid waste landfill.

An EPA reinterpretation of the PCB regulations issued in 2012 clarifies that PCB-contaminated building material is bulk product waste and is not considered PCB remediation waste if the PCB-contaminated building material is still a component of the building at the time of designation for disposal (https://www.epa.gov/sites/production/files/2016-01/documents/wste-memo_102412.pdf). This would allow all PCB-contaminated building materials at the Site to be classified as bulk product waste and disposed of in a solid waste landfill as long as all the building material was addressed as part of the same cleanup action as the building insulation, the original source of the PCB contamination. However, the Iowa Department of Natural Resources (IDNR) regulates PCB disposal based on concentration ($\geq$50 ppm), not by classification (remediation vs. bulk product waste). Therefore, all PCB bulk product waste must be sampled to determine if it may be disposed of in a solid waste landfill (< 50 ppm) or a RCRA Subtitle C Landfill ($\geq$ 50 ppm). Pursuant to IDNR regulations, if the PCB concentrations are over 50 ppm, the bulk product waste cannot be disposed of in a solid waste landfill. However, Iowa has indicated that the state has a special waste waiver that may be applicable and that would allow all PCB bulk product waste, regardless of concentration, to be disposed of in a solid waste landfill.

On-Site Disposal of PCB Contaminated Building Materials

The TSCA bulk product waste regulation found at 40 C.F.R. Part 761.62 does not discuss the on-site disposal of PCB contaminated building materials, only that PCB bulk product waste may be disposed of via performance based disposal, or in a solid waste landfill, as discussed above. If PCBs are to be disposed of in a different manner, such as on-site disposal[1], a risk based disposal approval may be sought pursuant to 40 C.F.R. Part 761.62(c). EPA Region 7's PCB coordinator has indicated that risk

[1] The EE/CA contemplates on-site disposal both as a separate alternative, Alternative 3, and as an aspect of Alternative 2, which allows for the potential for building debris to be used as fill.

based disposal for PCB bulk product waste would typically mirror the on-site disposal PCB remediation waste requirements of 40 C.F.R. 761.61(a)(4)(i)(A). Under this requirement, PCB remediation waste in high occupancy areas must meet the following criteria when it comes to onsite disposal: (1) concentrations ≤1 ppm can remain onsite without any additional protective measures; (2) concentrations >1 ppm and ≤10 ppm can remain onsite beneath a cap meeting the requirements of paragraphs (a)(7) and (a)(8) of 40 C.F.R. 761.61;[2] and (3) concentrations over 10 ppm may not be disposed of onsite.

Disposal of Waste Derived from Steel Beam Contamination
The steel beams, a component of the building materials, may be sold or recycled following decontamination procedures found at 40 C.F.R. 761.79. Any byproduct of these decontamination procedures containing PCBs would be considered PCB remediation waste, per 40 C.F.R. 761.61. This PCB remediation waste is subject to the disposal restrictions of 40 C.F.R. 761.62.

Pesticides – Based on 40 C.F.R. Part 261, the building debris could be classified as hazardous waste based on either chemical use in the buildings (40 C.F.R. § 261.33) or by waste characteristics during generation (40 C.F.R. § 261.24). The Site file shows that pure aldrin was sprayed onto fertilizer at the site and the fertilizer was stored on site, then sold. Based on 40 C.F.R. § 261.33, the demolition debris from buildings where aldrin was being sprayed onto the fertilizer would be classified as a P- and/or U-listed hazardous waste. This is because pure aldrin was used in the building and the contamination of the building materials is likely a result of contact with pure aldrin. Contamination that resulted from contact with the fertilizer made with aldrin would not be classified as hazardous waste under 40 C.F.R. § 261.33(d), as the fertilizer is a combined product. Therefore, identifying the locations where aldrin was sprayed directly on the fertilizer is critical for waste determination. According to the 1996 Feasibility Study and subsequent documents:

"Buildings 1 through 5 and the Maintenance Building were used by DiChem for the formulation of technical grade pesticides and herbicides into products suitable for sale. The primary formulation activities were conducted in Buildings 2 and 3 while Buildings 4 and 5 were primarily used for storage and delivery of chemicals and product storage."

However, the 1992 Engineering Evaluation Report states:

"Aldrin was received in cake form from Shell Oil Company and was melted in the tank. The aldrin was then transferred through overhead pipe to Building No. 4 where it was sprayed onto a fertilizer product."

These reports are inconsistent. The 1992 Engineering Evaluation Report goes into detail and describes how the aldrin was delivered, heated, and used at the Site. The report also discusses the removal of the aldrin tank from the maintenance building annex and the removal of piping from the maintenance building annex to Building 4. The Feasibility Study gives a general summary and was written after the aldrin equipment was removed. Because of the detail within the 1992 report, it is believed to be more accurate, which would mean that pure aldrin was only used in the maintenance building annex and Building 4 as part of the formulation process.

[2] The cap requirements at 40 C.F.R. 761.61(a)(7) requires a 6" asphalt cap or a 10" compacted soil cap, among other requirements.

Since the hazardous waste determination regarding pesticides will vary between buildings, a detailed evaluation is outlined below for each building and accounts for both characteristic and listed waste determinations, pursuant to 40 C.F.R. § 261.24 and 40 C.F.R. § 261.33. For the purposes of cost development in the EE/CA, it will be assumed that 25-75% of the overall building materials and foundations will be hazardous waste.

1. Production Building
    a. Building Use – Very little information about the production building was included in the reports within the Site file as the chemical operations were performed in the other buildings. Therefore, this production building was not included in the 1997 ROD.
    b. Sample analysis - While on site in 2016, building materials and foundations were sampled to determine whether contamination was present. Sample results from the analysis for total concentrations of pesticides were compared to the TCLP regulatory level in 40 C.F.R. § 261.24. Seven of 15 samples exceeded a 1:1 comparison for endrine and/or heptachlor. TCLP regulatory levels were multiplied by 20 to compare to the sample results of total concentrations, which is allowable by Section 1.2 of the TCLP (https://archive.epa.gov/epawaste/hazard/web/html/faq_tclp.html). None exceeded a 20:1 comparison.
    c. Waste Determination - The pesticides in the production building materials are not hazardous waste since the samples did not exhibit hazardous waste characteristics and no listed waste is believed to be present, given pure aldrin was not used in this building.

2. Building 1
    a. Building Use – This building was mainly used to house site boilers. No insulation was documented in the building.
    b. Sample analysis – Six samples were collected from this building and foundation in 2016. Sample results from the analysis for total concentrations of pesticides were compared to the TCLP regulatory level. Four samples exceeded a 1:1 comparison for endrine and/or heptachlor. Of these four samples, only the coating on the west wall exceeded the 20:1 comparison.
    c. Waste Determination - The use of the building does not support a listed hazardous waste classification for pesticides based on 40 C.F.R. § 261.33(d). However, building and foundation materials may be classified as characteristic hazardous wastes under 40 C.F.R. § 261.24 at the point of generation. The waste will need to be segregated into piles and samples analyzed using the TCLP method to determine proper disposal for materials contaminated with pesticides.

3. Building 2
    a. Building Use – The building was used in the production and storage of fertilizer, but pure aldrin was not used in the building. Insulation was documented in the roof of the building, which would be subject to the provisions described above for disposal of PCB-contaminated building materials.
    b. Sample analysis – Eight samples were collected from this building and the foundation in 2016. Sample results from the analysis for total concentrations of pesticides were

compared to the TCLP regulatory level. Seven samples exceeded a 1:1 comparison for endrine, heptachlor, and/or toxaphene. Of these seven samples, only the coating on the center wall exceeded the 20:1 comparison.

c. Waste Determination - The use of the building does not support a listed hazardous waste classification for pesticides based on 40 C.F.R. § 261.33(d). However, building and foundation materials may be classified as a characteristic hazardous waste under 40 C.F.R. § 261.24 at the point of generation. The waste will need to be segregated into piles and samples analyzed using the TCLP method to determine proper disposal for materials contaminated with pesticides and dioxin.

4. Building 3
    a. Building Use – The building was used in the production and storage of fertilizer, but pure aldrin was not used in the building. Insulation was documented in the roof and select walls of the buildings, which would be subject to the provisions described above for disposal of PCB-contaminated building materials.
    b. Sample analysis – Six samples were collected from this building in 2016. Sample results from the analysis for total concentrations of the pesticides were compared to the TCLP regulatory level. Five samples exceeded a 1:1 comparison for lindane, endrine, methoxychlor, heptachlor, and/or toxaphene. Of these, only the coating on the eastern center wall and the cinder block in the southwest corner exceeded the 20:1 comparison. The reporting limits for one of the foundations samples also exceeded the 20:1 comparison.
    c. Waste Determination - The use of the building does not a support a listed hazardous waste classification for pesticides based on 40 C.F.R. § 261.33(d). However, building and foundation materials may be classified as a characteristic hazardous waste under 40 C.F.R. § 261.24 at the point of generation. The waste will need to be segregated into piles and samples analyzed using the TCLP method to determine proper disposal for materials contaminated with pesticides and dioxin.

5. Building 4
    a. Building Use – The building was used in the production of fertilizer, and pure aldrin was used in the building. Only the building foundation remains at the Site.
    b. Sample analysis –Two samples were collected from the foundation in 2016. Sample results from the analysis for total concentrations of the pesticides were compared to the TCLP regulatory level. Both samples exceeded a 1:1 comparison for endrine and heptachlor. None exceeded the 20:1 comparison.
    c. Waste Determination – Because pure aldrin was used in the building, any waste material from the foundation that contains aldrin contamination could be classified as a listed hazardous waste under 40 C.F.R. § 261.33.[3]

6. Building 5
    a. Building Use – The building was used in the production and storage of fertilizer, but pure

[3] Building 4 and Maintenance Building foundation debris may contain trace amounts of contaminants such that a "contained in/contained out" determination could be made which would result in such debris not meeting the criteria of a listed hazardous waste.

aldrin was not used in the building. Only the building foundation remains at the Site.

b. Sample analysis –Two samples were collected from the foundation in 2016. Sample results from the analysis for total concentrations of the pesticides were compared to the TCLP regulatory level in 40 C.F.R. § 261.24. One sample exceeded a 1:1 comparison for endrine and heptachlor. None exceeded the 20:1 comparison.
c. Waste Determination – The use of the building does not support a listed hazardous waste classification for pesticides based on 40 C.F.R. § 261.33(d). However, foundation materials may be classified as a characteristic hazardous waste under 40 C.F.R. § 261.24 at the point of generation. The waste will need to be segregated into piles and samples analyzed using the TCLP method to determine proper disposal for materials contaminated with pesticides.

7. Maintenance Building
    a. Building Use – The aldrin tank was located in an annex to the building. Only the building foundation remains at the Site.
    b. Sample analysis –Two samples were collected from the foundation in 2016. Sample results from the analysis for total concentrations of the pesticides were compared to the TCLP regulatory level in 40 C.F.R. § 261.24. Both samples exceeded a 1:1 comparison for endrine and heptachlor. None exceeded the 20:1 comparison.
    c. Waste Determination – Because pure aldrin was used in the building, any material from this building and foundation that contains aldrin contamination could be classified as a listed hazardous waste under 40 C.F.R. § 261.33.[4]

[4] Building 4 and Maintenance Building foundation debris may contain trace amounts of contaminants such that a "contained in/contained out" determination could be made which would result in such debris not meeting the criteria of a listed hazardous waste.